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# Thinking big whilst making do: Mismatching expectations of a national human resource information system in healthcare

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## Abstract

We adopted a qualitative case study research design and examined a major Information System (IS) innovation project that aimed to develop and implement Human Resource Information System (HRIS) across all health organizations within one European National Health Organization (NHO). Here we set out to contribute to institutional literature by exploring the processes through which institutional pressures shape the intention to adopt, adoption and implementation of an IS innovation within an organizations setting, particularly by examining such influences over time. We also draw on the concepts of the organizing vision and strategic responses, in order to understand how organizational actors interpret the nature and goals of the innovation and respond to the various institutional pressures associated with them. Adopted institutional lens allowed us to explain the unexpected difficulties that NHO encountered during the implementation of this IS innovation that seems to have been strongly supported at the outset. Our results indicate that at the comprehension stage, alignments between all three types of institutional pressures led to cohesive expectations concerning the core business problematic of the innovation and resulted in an initial acquiescence response. As the innovation progressed through adoption and implementation, misalignments between coercive, normative and mimetic pressures begin to manifest more strongly, exposing the inherent conflicting expectations that became part of the organizing vision about the technology itself, the organizational practices that would be changed and how these would be addressed by the innovation. We also found that as changes in institutional demands increase the tensions within the organizing vision, the variety in response strategies also increases reflecting greater uncertainty. Thus whilst previous research indicates a linear move from acquiescence to manipulation as environmental uncertainty increases (e.g. Oliver, 1991), our findings suggest an increase in the variety of responses during the implementation stage ranging from compromise to manipulation.

## Introduction

Research examining technological innovations in healthcare settings recognizes that the uses and consequences of innovations emerge unpredictably through complex social interactions amongst the actors involved, their responses to and interactions with the innovation, and the organizational context in which they are situated (Robert et al., 2009; Waterson, 2014). Thus, identical technologies often lead to different outcomes in different settings (Barley, 1986). To effectively examine technology innovations in a healthcare context, research thus needs to account for interactions between technological, social and organizational systems, for which a context-sensitive theoretical approach is likely to be most fruitful (see Robert et al., 2009). Our analysis draws on institutional theory, which has been widely used to examine organizational change (e.g. Scott et al., 2000) and information systems (IS) implementation (e.g. Currie & Guah, 2007) in the context of healthcare. A key argument in institutional theory (cf. DiMaggio & Powell, 1983) is that, in order to survive within their environment, organizations need to conform to institutional expectations of what is considered legitimate, even if these have little to do with rational expectations of efficiency or effectiveness. In attempting to implement a new innovation, organisational actors may be exposed to multiple and conflicting institutional demands (Pache & Santos, 2010) which hinder their efforts (Currie & Guah, 2007). Failure to align an innovation successfully with institutional pressures may result in its abandonment (Bunduchi et al., 2015). While existing research on IS has tended to focus on identifying the institutional pressures that influence the adoption of innovations, less is known about the process through which these pressures shape these innovations, particularly their evolution from intention to adopt, through implementation to use. The objective of this research is therefore to examine the processes through which varied institutional pressures shaped the introduction of an IS innovation within an organizational setting during its life course.

To address this objective, we focus here on one particular category of complex IS innovation: Human Resource Information Systems (HRIS), delivered within the uniquely complex institutional setting of the public-sector organizations in one small European Union (EU) country. HRIS are complex administrative systems and despite their potential to reduce operational costs and improve patient care in health organizations (Thouin & Bardhan, 2009), there have been few efforts to study them systematically either within the health care sector or beyond (Riley et al., 2009). Indeed, most existing health IS research has prioritized clinical systems, largely overlooking IS for administrative functions (Kivinen & Lammintakanen, 2013). Nevertheless, these are essential enabling eHealth technologies for the business of healthcare, and underpin much of the drive towards health care quality and efficiency across the world (Thouin & Bardhan,

2009). Despite this importance, our systematic literature review of HRIS in healthcare found that the relevant literature is predominantly descriptive and often atheoretical, aiming to identify uncritically the visible drivers for HRIS development, factors influencing HRIS implementation and soft outcomes such as perceived benefits and disbenefits, levels of user satisfaction and ease of implementation.

Healthcare systems, particularly those in the public sector, are highly complex settings characterized by multiple institutional logics in the form of different norms, values and demands, which vie for dominance and shape the implementation and use of IS innovations (Currie & Guah, 2007; Ruef & Scott, 1998). Healthcare settings therefore provide fertile ground for investigating the processes through which institutional demands influence IS innovation. We adopt a qualitative case study research design and examine a major HRIS project that aimed to develop and implement HRIS across hospitals within one European national healthcare system. We develop a conceptual framework to examine the mechanisms through which the institutional pressures operating within a complex and institutionally rich context shape the IS intention to adopt, adoption and implementation process by drawing from the concept of organizing vision (Swanson & Ramiller, 1997) and strategic responses (Oliver, 1991).

## **Theoretical background**

While economic and resource dependency theories explain organisational behaviour in terms of rational self-interest calculations, institutional theory conceptualises it as the product of the ideas, values and beliefs embedded in the institutional environments in which organisations operate (DiMaggio & Powell, 1983). It posits that, in order to survive in these environments, organisations and their personnel often act according to what is perceived to be legitimate, rather than what is perceived as rational in terms of efficiency and performance (Meyer & Rowan, 1977).

DiMaggio and Powell (1983) describe three key sources of institutional pressures, coercive, mimetic and normative. *Coercive* pressures arise from the formal rules, standards or regulations imposed by institutional actors in the wider environment surrounding organisations, such as the need to comply with standards and regulations, or from top-down strategies, such as government deadlines or targets. *Mimetic* pressures arise from the motivation to imitate other organisations that are perceived to be successful in a similar environment. *Normative* pressure chiefly comes from the informal social norms operating within professional groups. Ruef and Scott (1998) differentiate between two types of normative pressure: *managerial* norms relating to organisational mechanisms, such as accounting practices or rules of personnel conduct, and *technical* norms, such as expected qualifications and training, work procedures and quality

assurance mechanisms. Managerial and technical norms can be concerned with different values, for example in some healthcare environments, managerial norms may emphasise efficiency and cost containment, whilst technical norms may prioritize quality of patient care and speciality training (Ruef & Scott, 1998; see also Bunduchi et al., 2015).

Several or all of these coercive, mimetic and normative pressures can operate at once (Provan et al., 2004), thus, in attempting to implement a new innovation, organisational actors may be exposed to multiple and conflicting institutional demands (Pache & Santos, 2010). Being able to align innovations with these institutional demands is crucial to their successful adoption and use (Currie & Guah, 2007; Bunduchi et al., 2015). However organisational actors have agency and may choose to respond to these pressures in various ways in order to gain legitimacy or advance their specific interests.

Oliver (1991) has described five main categories of these strategic responses to institutional pressures: acquiescence, compromise, avoidance, defiance and manipulation, depending on the level of authority and uncertainty in the environment. *Acquiescence* involves conforming to institutional expectations; *compromise* refers to the organization's attempts to balance, pacify or bargain with external constituents to match conflicting institutional expectations; *avoidance* involves finding strategies to circumvent the need to conform to external pressures; *defiance* involves the rejection of institutional norms, and *manipulation* involves changing the institutional expectations or the sources through which these expectations are exerted. According to Oliver, the deployment of these responses depends on the levels of authority and uncertainty within the organisation; for example a high level of authority favours acquiescence, whilst low authority coupled with high uncertainty favours compromise and avoidance. The structure of organisations also influences the likelihood of particular responses (van Dijk et al., 2011), for example a homogenous institutional environment encourages conformity (acquiescence in Oliver's terminology), whereas a diverse environment with multiple institutional logics favours transformation (akin to Oliver's manipulation) (van Dijk et al., 2011). Strategies also vary over time, as conditions in the environment change, forming patterns of conformity or non-conformity (see Standing et al, 2008).

### **Institutional theory in IS research**

DiMaggio and Powell's (1983) popular structuralist approach to institutional theory prompted many researchers to adopt their framework for understanding the role of context in shaping IS innovation process. Several recent reviews of institutional research in IS (e.g. Mignerat & Rivard, 2009; Weerakkody et al., 2009) demonstrate the popularity of institutional theory with IS researchers, who often deploy it as a comprehensive framework for analysing "*how institutions*

*influence the design, use, and consequences of technologies, either within or across organisations*” (Orlikowski & Barley 2001, p.153).

By and large institutional IS research focuses on examining the influence that coercive, mimetic and normative pressures play during the different stages of an IS innovation (see Bunduchi et al, 2015 for a discussion). While such research provides useful insights for understanding the role that context plays in shaping IS innovations, institutional theory is often used in a simplistic way, assuming that coercive, mimetic and normative pressures within organisational units align with a set of higher-level institutional logics, and that individual actors are passive subjects of these forces whose only option is to conform (DiMaggio & Powell, 1983). As discussed earlier, developments in institutional theory over the past 30 years have provided a much more nuanced understanding of organisational behaviour, recognising both the existence of multiple and often conflicting institutional logics and demands (Friedland & Alford, 1991; Pache & Santos, 2010) and the agency of individuals and teams capable of actions to retain, adopt or discard the norms, values and expectations influencing their organisational behaviours (Greenwood & Hinings, 1996; Greenwood et al., 2010). However, a handful of IS studies recognise the agency of individual actors (e.g. Jensen et al., 2009), consider changes in responses over time (Standing et al., 2009), examine how innovations are shaped by conflicting institutional logics (Currie & Guah, 2007) or investigate how actors respond to multiple or conflicting institutional pressures (e.g. Berente & Yoo, 2012; Bunduchi et al., 2015). Berente and Yoo (2012) focus on the institutional properties of IS themselves (Gosian, 2004), examining how actors resolve the conflict between the logic embedded in the technology and the organisation (see also Cho & Mathiassen, 2007; Jensen et al., 2009). They draw from the concept of ‘loose coupling’ (see Meyer & Rowan, 1977) to explain how individual actors attempt to reconcile conflicting institutional logics with the requirements of IS innovations. In contrast, Bunduchi and colleagues (2015) focus on the conflicts between the institutional field(s) in which an IS innovation is developed and implemented, and how these shape adoption. They draw on the concept of the ‘*organising vision*’ (Swanson & Ramiller, 1997); the group’s collective understanding of how the innovation will be embedded and utilised within the structures and processes of their organisation (Swanson & Ramiller, 2007). It includes the *business problematic*, or the organisational issues that the innovation is supposed to solve, the *core technology* itself, and the *organisational practices* associated with the innovation. The organising vision is typically underdeveloped at the early stages of a new project, and develops as the technology and actors’ understanding of its possibilities, co-evolve. Organising vision facilitates the interpretation of the innovation by actors tasked with delivering it, helps to legitimise the innovation within the

organisational context, and helps to mobilise support for realising the effective delivery and adoption of the innovation (Swanson & Ramiller, 2007). The concept was developed to explain how institutional processes shape the early adoption of IS innovations (not only the diffusion stages) and has been used to explain the retarded institutionalisation of some innovations during the later stages (Swanson & Ramiller, 2007; see also Currie, 2004; Davidson et al., 2015). The concept has also been used to understand the development and adoption of IS innovations at the inter-organisational (Lyytinen & Damsgaard, 2011) and intra-organisational levels (Bunduchi et al., 2015). We use it here to examine how organisational actors interpret and make sense of this innovation during different stages of its life course. We draw on the four stage model of IS innovation first described by Swanson (Swanson & Ramiller, 2004) which has been successfully adapted for studies examining IS from an Institutional Theory perspective (Mignerat & Rivard, 2009). These stages, which are shaped by institutional demands, are: *comprehension or intention to adopt* (including the organizing vision that precedes the decision to adopt the innovation); *adoption* (planning for the project, including developing the business proposition and identifying organisational barriers and facilitators); *implementation* (including practical aspects of data migration, systems configuration or testing, alongside change management processes); and *assimilation* (integration into workflow and demonstrated usefulness). Since our study concerns a multi-site IS programme that has not yet been fully implemented we focused on the first three of these stages: intention to adopt, adoption and implementation.

## **Methodology**

### **Innovation, Setting and Selection**

The innovation under study is a national-scale program in one EU National Health Organization (NHO) to implement a new HRIS across all its Regional Health Organizations (RHOs). The health system is sponsored by and accountable to the government's health department and care is delivered by a number of RHOs. RHOs are separate legal entities each with their own Human Resource (HR) department, which manage HR issues for the hospitals and other health units within the RHO's remit. RHOs together are part of the wider macro-organizational enterprise. The HRIS implementation program involved the rollout of a modular system across all RHOs, with a view to harmonizing the IT landscape for greater efficiencies and improved information sharing. At the outset of the project multiple electronic and paper-based systems were in use. An existing payroll system had already been implemented nationally and was therefore to be retained. A central national project team was set up to procure the system, work with the vendor and support RHOs during the implementation of the system, with most of technical implementation

activities delegated to local RHOs. The HRIS was procured from an international IT vendor which already provided a number of other national-level IT services.

The HRIS is an off-the-shelf solution including Core HR, Employee Relations, Self-service, iRecruitment, Learning Management and HR analytics modules. Implementation of the system was scheduled to take place in five staggered phases, whereby RHOs would gradually join. The implementation project was scheduled to take place between 2011 and 2014, however was still in progress at the time of our data collection (see Figure 1).

Figure 1. Project Timeline

Planned Go Live*	HRIS Specification	Business Case & Procurement	HRIS Testing, Training & Phase 1	Phase 2&3	Phase 4&5				
COMPREHENSION		ADOPTION		IMPLEMENTATION			ASSIMILATION**		
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Actual Go Live*	HRIS Specification	Business Case & Procurement	HRIS Testing, Training & Phase 1		Phase 2	Phase 3&4	Phase 5 & Pilot	Remaining RHOs	
*Go Live=System data is used in a live environment									
**Not in the scope of this study									

## Research Design

We used a qualitative embedded case study approach (Yin, 2009), which allows access to rich and detailed contextualized data and has been used successfully to study other top-down technology implementation projects in complex healthcare contexts (Cucciniello et al., 2015). In this case, NHO is the largest unit of analysis, with selected RHOs as its sub-units (see Table 1 for a description of the RHOs). We first studied the program at the national level (the wider unit of analysis) by focusing on the national project team, and then examined eight of these RHOs in depth as embedded cases, selected to represent a range of geographies and implementation phases, based on our analysis of project documentation and conversations with the program lead. Our case comparison across the eight embedded units of analysis provides opportunities to examine shared and case context-specific themes (cf. Yin, 2009).

## Data collection

The data was collected in the second half of 2015 when the project was reaching its end, with an evaluation of the system being arranged for the end of the year, and full roll-out across the RHOs in the next year. Two primary methods of data collection were employed: semi structured interviews (n=25) with key stakeholders (n=31) involved in the comprehension, adoption and implementation of HRIS (see Table 1); and documentary analysis, based on historical information about the HRIS project over the previous four years from the outset of the project (details below).



The interviews lasted an average of 50 minutes each (range 22-100 min) and were recorded and transcribed verbatim, with the transcripts sent to respondents for verification, and clarification where necessary.

Table 1. Study Respondents

Organization/Team	Respondents	Number
National Project Team	National Project Team Respondents	3
eHealth Division	eHealth Respondent	1
Procurement Team	Senior Procurement Respondent	1
Vendor	Key project participants	2
System Supplier	Key project participant	1
RHO 1 (Small RHO; had HRIS)	Senior HR Executive	1
RHO 2 (Big RHO; had HRIS)	Senior HR Executive	1
RHO 3 (Small RHO; had HRIS)	Senior HR Executive	1
	Implementation Team Member	1
	HR Professional	1
RHO 4 (Medium RHO; did not have HRIS)	Senior HR Executive	1
RHO 5 (Special RHO with clinical staff; had HRIS)	HR Professionals	2
RHO 6 (Medium RHO; did not have HRIS)	Senior HR Executive	1
	HR Professionals	2
RHO 7 (Special RHO with non-clinical staff; had HRIS)	Senior HR Executive	1
	HR Professionals	4
	Manager user	1
RHO 8 (Big RHO; had HRIS)	Senior HR Executive	1
	Implementation Team Members	4
	Employee user	1
Total		31

Respondents were selected to take part based on their knowledge of the HRIS project, and their involvement in it. Potential bias in selecting respondents was addressed by the diversified sampling strategy. Interviewees were either recommended by the projects' national lead, snowball sampled (e.g. interviewees were asked to recommend other project stakeholders who could contribute to the study) or volunteered to participate in our research.

Secondary data collection involved relevant internal and publically available documentation relating to the project's comprehension and adoption (e.g. national IT strategies, tender and system specification documents, etc.), implementation (e.g. Gantt charts, local implementation plans of various RHOs, end of pilot and lessons learned reports) covering the duration of the project. Internal documents related to the HRIS comprehension and adoption were provided by the projects' national lead, while the internal local implementation plans were provided by the interviewees from some RHOs. Publicly available project related national IT strategies were

searched via Google search engine. Documentary analysis was used as a comparator to the data collected via interviews in order to increase the validity and robustness of our study findings.

### **Data analysis methods**

To analyze the qualitative data we began with a grounded theory approach (Glaser & Strauss, 1967), using open coding of transcripts. In order to optimize inter-coder consistency one of the richest transcripts was first *open coded* independently by two researchers, who iteratively reviewed their emergent codes. Analysis then moved on to the *interpretation stage*, entailing searching for patterns and relationships and developing the coding framework. Interpretation involved a highly iterative process of going back and forth from the data to the literature to explore concepts, interpretations and patterns that could illuminate the behaviour of the actors and the shape of the IS innovation process. During the interpretation stage of data analysis, the concept of institutional forces, in particular coercive pressure from government, first emerged and seemed to provide a powerful explanation for changes in the innovation process during its early stages. This prompted us to explore institutional theory as a means of enriching the interpretive framework for our observations. We then revisited and re-coded the data with reference to the institutional pressures, organising visions and strategic responses characterising the innovation stages of comprehension, adoption, implementation that also emerged from our data. The tables in the following sections illustrate the final coding framework, the data structure after re-coding and exemplary quotes.

## **Results/Case Study**

The objective of this research was to examine the processes through which complex and multiple institutional contexts shape IS innovations. Our emergent framework includes three dimensions related to the *institutional pressures* operating at different stages of the innovation project, their influence on the organisational actors' *strategic responses*, and the changes to the actors collective understanding, i.e. their *organising vision*, of the IS innovation project. These results are discussed according to the three stages of the innovation that were studied: intention to adopt, adoption, and implementation. This is also valuable as a means of demonstrating the evolution and influence of institutional pressures, as well as actor's strategic responses over time.

### **Innovation Stage 1: Comprehension/ Intention to Adopt**

All three types of institutional pressure (coercive, mimetic, normative) influenced the NHO's intention to adopt the HRIS (see Table 2). Each of these generates particular expectations among

the relevant actors, concerning the organisational issues that the new system was supposed to address, contributing to a cohesive business problematic within the organisational community.

Table 2. Stage 1: **Comprehension/Intention to Adopt**. Data structure and exemplary quotes

Institutional Pressures	Organising vision
<b>Coercive =&gt; Business problematic</b>	
Government pressure for accurate health workforce data [ <b>coercive</b> ]: “There was a real desire for consistent and accurate workforce information from [the Government]”. (National Project Team Respondent 1, IAP 1)	New HRIS will be used for statutory reporting [ <b>business problematic</b> ]: “It should enable us to get some really good reports about the organization and its workforce.” (Senior HR Executive, RHO 2, IAOV 1)
Government vision for HR shared services [ <b>coercive</b> ]: “The overall directives come from the [Government] and they’re looking to have shared services within HR, so we all need to be working off the one system and working in the same way.” (Implementation Team Member, RHO 8, IAP 2)	New HRIS would replace all pre-existent HRIS across individual RHOs [ <b>business problematic</b> ]: “HR experts got together and thought instead of having individual systems that didn’t really talk to each other, we should have one national system.” (Senior Procurement Respondent, IAOV 2)
Government’s digital integration agenda [ <b>coercive</b> ]: “What I would say is, and this has been one of the fundamental things from the start, is that the system itself was required to integrate with a number of other national feeds” (National Project Team Respondent 2, IAP 3).	New HRIS will be an incremental step in merging pre-existent national payroll system with the new HRIS [ <b>business problematic</b> ]: “I think we all believe that we’ll get to an integrated HR and payroll system but to get there, we had to do this, so we had a national payroll system to get a national HR system and then we could start to look at merging the two. So it was seen as a, kind of, incremental step to getting to where we would finally land up.” (National Project Team Respondent 1, IAOV 3)
	New HRIS will become a single instance system [ <b>business problematic</b> ]: “It should be a single instance system. There were a number of manufacturers out there who could have given us [many systems] and then kind of interfaced them together but we didn’t want that.” (National Project Team Respondent 2, IAOV 4)
Enforced employee data protection law [ <b>coercive</b> ]: “Data Protection laws became more and more strong and protective of data and the individual and the, kind of, you should only see data if you have a need to know it. Therefore, we had to kind of stop putting stuff through a payroll system that was HR information because the payroll system was designed to pay people and knowing all sorts of things about individuals, what we collected through our payroll system we originally we collected our equal opportunities data, now there was absolutely no need for that to be known in payroll” (National Project Team Respondent 1, IAP 4)	Needed to have HR system as well [ <b>business problematic</b> ]: “So we then worked on a specification for the national HR system.” (National Project Team Respondent 1, IAOV 5)
<b>Managerial normative =&gt; Business problematic</b>	
Variety of HR management practices adopted to reflect the diversity within RHOs [ <b>managerial normative</b> ]: “There’s slight difference between recruiting somebody who’s in administration or management as opposed to a clinician. So	System should not be customizable by individual RHOs [ <b>business problematic</b> ]: “We also didn’t want any ability for [RHOs] to be able to tweak their bit of the system to what they wanted and then

<p>although the process is similar, is the same, you know, there's different qualifications, different things they have to look at and they go through maybe a different selection process." (eHealth Respondent, IAP 5)</p>	<p>find of course it doesn't actually match up with the data in all of the other [RHOs] because unfortunately, across an organization like this, there are [many] variations of the truth if you like. So [RHOs] will implement things in their own way, they have slightly different procedures, they interpret the regulations slightly differently, they apply them slightly differently." (National Project Team Respondent 2, IAOV 6)</p>
<p>Need for accurate data for efficient workforce planning and management <b>managerial normative</b></p> <p>"There was a kind of belief that it's the best thing for [NHO] to have this kind of information... a huge information and very, very helpful for everybody from management and HR corporately up to [RHOs] and up to the Government." (National Project Team Respondent 2, IAP 6)</p>	<p>New system will enable data sharing between RHOs and also ease the recruitment process <b>[business problematic]</b>:</p> <p>"I mean one of the wonderful things I think about the recruitment side of things which is good, once you register on that you've got [huge number of] people who you can, as a recruitment officer if you said 'oh I've got a nursing job for midwifery' you can actually, if people have registered and said 'I'm interested in midwifery jobs' you can send them all e-mails saying 'here's a job come up' and suddenly you've got this huge number of people that you could never get hold of before. You could put an advert in the paper or you could put things on Internet sites but if they don't go and look at it, now you can actually send stuff out." (National Project Team Respondent 2, IAOV 7)</p>
<p>Reduce amount of administrative work for HR professionals <b>[managerial normative]</b>:</p> <p>"It would save time for the HR department because we wouldn't be doing a lot of the admin that we currently do, that responsibility would be put onto managers and that it would enable your managers to manage their tasks more effectively if they were to have all the information. What else. It would enable, you know, the HR department to concentrate on other work, you know, that they should be doing." (HR Professionals, RHO 5, IAP 7)</p>	<p>Data provided to managers will help them to manage their teams better <b>[business problematic]</b>:</p> <p>"Basically for the manger to have full access to their team's terms, conditions, absence, training – things like that. So that's the kind of main benefits." (HR Professional 1, RHO 6, IAOV 8)</p> <p>All staff within each RHO will use the new HRIS <b>[business problematic]</b>:</p> <p>"The whole point about [new HRIS] is that every employee will use [it]. (eHealth Respondent, IAOV 9)</p>
<p><b>Technical normative =&gt; Business problematic</b></p>	
<p>Need for health workforce data to monitor statutory registrations of medical professionals <b>[technical normative]</b>:</p> <p>"So if you're a doctor, you must be registered with the [Professional Medical Association]. If you're a nurse, you must be registered with the [Professional Nursing Association] and so it goes on." (National Project Team Respondent 1, IAP 8)</p>	<p>System will be interfaced with the system of Professional Medical Association <b>[business problematic]</b>:</p> <p>"To have an interface from the [Professional Medical Association] to update the doctors' registrations." (National Project Team Respondent 1, IAOV 10)</p>
<p>Ensure that NHO has skilled workforce and capacity to deliver high quality care <b>[technical normative]</b>:</p> <p>"It does touch on some of the key aims of the e-health strategy of ensuring that you've got a skilled workforce and you have the capacity to be able to deal with the workload that you've got within the organization and therefore... it does connect into e-health." (eHealth Respondent, IAP 9)</p>	<p>Data from workforce will be used for better workforce planning <b>[business problematic]</b>:</p> <p>"Recruitment in the [NHO] is absolutely top priority at the moment. We really struggle to get people in, we've got real recruitment shortages, staff shortages and things like that." (National Project Team Respondent 2, IAOV 11)</p>
<p><b>Mimetic =&gt; Business problematic</b></p>	
<p>Similar ongoing national IT projects in the neighboring country NHO <b>[mimetic]</b>:</p>	

<p><i>“At the time they were doing a similar kind of process, they were ahead down in [neighboring country], [HRIS] that they have down there, so it was kind of looked at that.”</i> (National Project Team Respondent 2, IAP 10)</p>	<p>New system is used by other complex organizations: therefore, NHO should also adopt one [<b>business problematic</b>]:</p> <p><i>“If you look at the “system supplier” system, the “system supplier” product has been very successful...You know, there’s some large organizations with-, and there’s some worldwide organizations who just have the “system supplier” product and it works.”</i> (Senior HR Executive, RHO 2, IAOV 12)</p>
<p>Similar ongoing IT projects in other large organizations [<b>mimetic</b>]:</p> <p><i>“I suppose if you look across industry, most large scale organizations would have an HR system and we didn’t.”</i> (Senior HR Executive, RHO 2, IAP 11)</p>	
<p>Similar ongoing national IT projects in the NHO [<b>mimetic</b>]:</p> <p><i>“We’ve got quite a few national systems, clinical systems particularly. There’s quite a lot of clinical systems. Most of those are delivered through – in fact the same as this – they’re all delivered through kind of web browsers; it’s the easiest way of doing it.”</i> (National Project Team Respondent 2, IAP 12)</p>	
<p><b>Strategic response</b></p>	
<p><b>Acquiescence:</b> <i>“Rather than say it’s mandatory, all [RHOs] committed to sign up to it as a consortium approach, because obviously the view was we would want a common system across [NHO]”.</i> (Senior HR Executive, RHO 2, IASR 1)</p>	

The key **coercive** pressure that prompted this project was a political agenda, in particular the government’s desire for more accurate workforce data in order to create and implement effective policies (Table 2, Quote IAP 1). This demand created the expectation among RHOs that the new HRIS would be widely used for statutory reporting purposes (Table 2, Quote IAOV 1). Having a national HR system that would be used by all individual RHOs within the country was also consistent with the government’s vision for rationalising IT provision within public services, in order to avoid the inefficiencies associated with multiple products, improve interoperability between IS, and facilitate consistent information management and quality reporting (Table 2, Quote IAP 2, 3). This demand for shared services created expectations among RHOs that a core part of the business problematic addressed by the new system would be the replacement of all existing HRIS, whether digital or paper based (Table 2, Quote IAOV 2). A further coercive pressure was shaping the intention to adopt the system was the government’s strong digital integration agenda to ensure that all national IT systems are fully interoperable. Consistent with this expectation, managers believed that the new system would replace a wide variety of pre-existent regional systems, thus delivering a single instance HRIS rather than multiple interfacing systems (Table 2, Quote IAOV 3, 4). Moreover, the NHO already had a standard electronic system to support its payroll administration activities on a national level, which was used also as a main data source for statutory reporting purposes. However, as the EU data protection law was re-enforced, it required that employee payroll and HR information be stored in separated systems (Table 2, Quote IAP 4). This EU regulatory coercive pressure had also prompted the search for a

new HR system to manage employee data in parallel with the existing national payroll system (Table 2, Quote IAOV 5).

The intention to adopt was also influenced by strong **normative pressures**, both managerial and technical. *Managerial normative pressures* were manifested primarily as the need to maintain oversight of the vast diversity of structures, processes and practices characterising NHO's HR operations, and the vision for improved efficiency through greater standardisation across RHOs (Table 2, Quote IAP 5). However, the RHOs themselves are heterogeneous – they may consist of one hospital or a collection of hospitals, be large or small, urban or rural, general or specialised, thus influencing the size and composition of their workforce (e.g. clinicians, nurses, administrative personnel or drivers), as well as HR processes that are adopted to manage them. The key implication of these normative pressures for standardisation was the expectation that the system would not be customisable by individual RHOs, thus reducing the variety in HR practices and enabling more efficient management practices (Table 2, Quote IAOV 6).

A further managerial pressure was related to the government's vision that more accurate and usable data would enable more efficient workforce planning, better management/reduction of staff absences/shortages (Table 2, Quote IAP 6) and easier recruitment and retention of staff (especially in remote and rural areas) (Table 2, Quote IAP 7). A priority perceived by both the NHO and the RHOs was the severe workforce shortage, particularly in rural areas, exacerbated by the aging population. It was envisioned that the new HRIS would enable the sharing of information between individual RHOs to facilitate intra-organizational transfers to help meet recruitment needs, as well as reducing the time and administrative work associated with these processes (Table 2, Quote IAP 7). It was also envisaged that data would be made available to managers to help them manage their teams better, and allow administrators to take responsibility for certain tasks previously performed only by HR professionals (Table 2, Quote IAOV 8). The demands for accurate data shaped the organisational actors' widespread expectations that the system would be universally deployed throughout the organisation, being used across all RHOs and all professions and staff, thus allowing a more accurate representation of personnel data and allowing better personnel management (Table 2, Quote IAOV 9).

*Technical normative pressure* was manifested via the demand from professional medical association for accurate and up-to-date data on NHO's medical professionals to allow for the monitoring of members' professional qualifications and registrations (Table 2, Quote IAP 8). This pressure created the expectation that the system would interface with the system of professional medical association to allow for data exchange (Table 2, Quote IAOV 10). A further technical pressure was the concern of the NHO to ensure that it has the right capacity of skilled

medical workforce to deliver high-quality of care to their patient, thus safeguarding patient safety and quality of care (Table 2, Quote IAP 9). This technical pressure contributed to the expectations that the organisational application of the system would ensure that the data will be used to allow better workforce planning (Table 2, Quote IAOV 11).

Finally, the project was also driven by **mimetic** pressures. The NHO followed the example of the HRIS adoption in the NHO in the neighboring country, which had a very similar structure but was of significantly vaster scale (Table 2, Quote IAP 10). Close monitoring of the neighboring NHO was evident across a range of initiatives in health well beyond the HRIS. The initiation of a similarly large scale HRIS initiative in the neighboring NHOs created the expectations that HRIS are required and successful in complex organizations (Table 2, Quote IAOV 12). Moreover, the intention to adopt was also shaped by the examples of similar IT implementations in other large scale organizations from different industries, which already had or were in the process of implementing organization-wide HRIS, and which were driven by the need to maintain their employer competitiveness (Table 2, Quote IAP 11). These needs shaped the NHO expectations of the organizational issues solved by the new HRIS as it was envisaged that having an easy to use recruitment IS would be an advantage for potential candidates, thus supposing to help NHO to quickly fulfill its vacant positions. A further mimetic pressure emerged from the ongoing in parallel national projects on replacing variety of regional clinical (e.g. electronic prescribing) and administrative (e.g. finance) IS across individual RHOs with standardized nation-wide systems (Table 2, Quote IAP 12). The large number of similar projects re-assured IT actors with respect to the technical aspect of delivery of the HRIS as similar projects were delivered through similar technical interfaces.

In conclusion, at this stage, strong coercive, normative (primarily managerial) and mimetic demands shaped the emerging organizational vision of the actors concerning the HRIS that was intended to be procured especially around the *business problematic*. The system was envisaged as a single point of entering data, deployed across the entire NHOs, replacing a wide variety of HRIS that were used, and providing a range of benefits across all organizational actors: to HR by reducing their administrative work; to managers, by enabling them to manage their teams better; to the IT support team by reducing the need to support a variety of different IT systems and through not supporting customization; to the medical staff by facilitating interfacing with their professional association; to RHOs by allowing better capacity allocation of skilled requirement; to the NHO by enabling better workflow data management; and to the government by facilitating statutory reporting. The inherent contradictions within the business problematic, for example the lack of customization to allow better IT support, but which would require RHOs additional

changes in their existing HR practices and structures, did not seem to be acknowledged at this stage by the organizational community. The confluence of strong institutional demands for the system shaped the expectations of the community of actors which were aligned at this stage around the range of organizational issues that the innovation would address thus explaining the response of individual RHOs to *acquiescence* and engage with the system (Table 2, Quote IASR 1). Our respondents emphasized that all RHOs were committed to sign up to the innovation and particularly to the envision application as a common system deployed throughout the NHOs.

## Innovation Stage 2: Adoption

All three types of institutional pressure are evident during the adoption stage, generating significant shifts in the business problematic associated with the emerging vision around the new HRIS, and shaping the expectations around the core technology and the organisational practices involved in the adoption and implementation of the system (see Table 3).

Table 3. Stage 2: **Adoption**. Data structure and exemplary quotes

Institutional Pressures	Organizing Vision
<i>Coercive =&gt; Business problematic, Core technology &amp; Organizational practices</i>	
Pressure on public sector and NHO to reduce spending [ <i>coercive</i> ]: <i>“Now the [NHO] has been cut back, cut back, cut back, as all public sector have, and there isn’t this spare capacity. Well I don’t think there ever was but there isn’t even the opportunity to find any spare capacity or even go and ask for additional funding because the answer is quite firmly no, there is no extra money. So again, your hands are tied by the kind of financial pressures of doing a big project within a public sector.”</i> (National Project Team Respondent 2, AP 1)	Created expensive specification can be reduced to match available financial resources [ <i>business problematic &amp; core technology</i> ]: <i>“The scope was too wide, even when we cut it down, it was going to be expensive. And we cut it -, it was quite easy through discussion with our HR directors to say ‘right, we’ll take that out, we’ll take that out, we’ll take that out and this is what we’ll then go for’.”</i> (National Project Team Respondent 1, AOV 1)
	Chosen restricted procurement process was suited for tight specification and available budget [ <i>organizational practices</i> ]: <i>“So at that point, we started looking at the invitation to tender, then all tendering process and you can either do an open procurement or a restricted procurement and we decided that because our spec was quite tight, we would go for a restricted procurement, which should have cut down on the time that it took to go through the procurement process”</i> (National Project Team Respondent 1, AOV 2).
Regulations on equality of diversity [ <i>coercive</i> ]: <i>“There are so many guidelines and regulations that the [NHO] puts in place and probably public sector does this around equality, around the ability of managers to do recruitment and so on and so forth.”</i> (National Project Team Respondent 1, AP 2)	System will be customizable [ <i>business problematic</i> ] <i>“I kept saying to “the vendor” and to “system supplier”, you know, ‘we’re special but we’re not that special and what we are asking you for here in our view is actually illegal - it’s legislative for us and therefore it must be legislative for everybody else’ and when you buy the “system supplier” system, it’s set up as a global worldwide system and you get it set up for the legislation in your part of the world..., but still they said ‘no that’s not how it’s built’ and I had difficulty with that on a personal level, because I thought</i>



	<p>well for goodness' sake, you know, how on earth.” (National Project Team Respondent 1, AOV 3)</p> <p>System customization led to increased system specifications [<b>core technology</b>]:</p> <p>“There was no realization that if I asked for that specification there was going to be so much change to organizations, to the system that then it would make it not fit for purpose, so didn't realize the impact that was going to have. I don't suppose anyone did.” (HR Professionals, RHO 5, AOV 4)</p>
<b>Managerial normative =&gt; Core technology</b>	
<p>Variety of HR management practices that reflect RHOs diversity [<b>managerial normative</b>]:</p> <p>“I would say that there was a degree of difficulty because you've got [large number of RHOs] with different systems currently in use. So to merge all the systems to a system that suits all the [RHOs] and all the processes and systems then I think the range now of the specification became quite wide.” (HR Professionals, RHO 5, AP 3)</p>	<p>System needs to be customizable to accommodate variety in RHOs practices [<b>core technology</b>]:</p> <p>“They had the specification and then obviously the system they bought was just an off the shelf system that they just put the basic package and then obviously they needed to customize it to meet with the needs of all the [RHOs].” (HR Professionals, RHO 5, AOV 5)</p>
<b>Technical normative =&gt; Organizational practices</b>	
<p>Extensive consultative processes that characterize all processes within health organizations [<b>technical normative</b>]:</p> <p>“That's the way we work in the [NHO], it's no different to this project. So at the end of the day we're very consultative...You can't buy a product and then insist that [all RHOs] will bring it in without any buy in and consultation. So no matter what you do, if you're bringing in a national project you need to get all your stakeholders to agree to it. So that's not a criticism you would expect there to be dialogue and consultation and engagement and people tied into it.” (Senior HR Executive, RHO 2, AP 4)</p>	<p>Extensive consultative processes are needed to elicit requirements, and ensure the “buy in” into the system [<b>organizational practices</b>]:</p> <p>“In writing the requirements we had gone out to the whole of the [NHO] HR services across [the country] and invited people in in groups, expert groups within various elements – recruitment, employee relations, you know, attendance and training – and we put these people in a group. So we had groups of what we call experts if you like. They formed what we called workflow groups. Now they were the experts that informed the requirement specifications for their areas so we knew exactly what it was that was needed. They also, and they still run today albeit in slightly different forms, they were also there to be the kind of expert users as we went through the conference room pilots, through into testing and so on and so forth. So if there's anything as a central team as we had here and we weren't sure what was needed, we would go and ask the expert groups to give us advice and guidance on this. And those groups, as I say, still run today.” (National Project Respondent 2, AOV 6)</p>
<b>Mimetic =&gt; Core technology &amp; Organizational practices</b>	
<p>System supplier system was also procured in a neighborhood country [<b>mimetic</b>]:</p> <p>“I think it was the “System Supplier” [HRIS].” (Senior Procurement Respondent, AP 5)</p>	<p>New system had to be HR lead, not Payroll led like in a NHO in a neighborhood country [<b>core technology</b>]:</p> <p>“The other issue was that we actually have a payroll system that works and is national and if you were implementing a new system we'd actually get caught up in implementing the payroll part of it</p>

Used HRIS specification of a neighborhood country, but localized it according to the NHO requirements [ <i>mimetic</i> ]: “So we then worked on a specification for the national HR system and what we did was we stole with pride the [other EU country] specification for their scheme and we worked on that and we tartanised that, we made it very [local]” (National Project Team Respondent 1, AP 6)	to ensure that people were paid and the HR part of it, which is the bit we really wanted, would be second-rate, and that’s what happened in [a neighborhood country]...., [but] they had a number of different payroll systems, which we didn't have, and so that led to us getting to the point of saying ‘well look, let’s get an HR system and link to payroll” (National Project Team Respondent 1, AOV 7)
Chosen vendor is a current managed technical service provider [ <i>mimetic</i> ]: “The “vendor” already help support [NHO] systems, not all of them but some of them” (Senior HR Executive, RHO 2, AP 7)	Chosen vendor has experience of delivering IT projects for NHO [ <i>organizational practices</i> ] “They are the major providers for other clinical systems, it’s not that they didn't have the experience of the difficulties of delivering something.” (National Project Team Respondent 1, AOV 8)
<b>Strategic response</b>	
<p><b>Compromise</b> Now if there’s something that doesn’t necessarily cost money but would impact other [RHOs], I’ve got to ask [them].... I chair the deputy directors of HR for [NHO]. So I check with my colleagues, my deputy directors, any impacts it would have on their [RHOs]. I guess an example of that was there was an alert in the system for fixed term contracts. The alerts were set at 30 days – 90 days and then 30 days – and a couple of the [RHOs] had come to me saying that they would prefer it to sit at 120, then 30 days. So that had an impact. So I had to check with my colleagues a preference and I just went with the majority, which was now 120 and then 30 day alerts. So it’s things like that, that I make sure that other [RHOs] understand the implications of changing these alerts.” (Senior HR Executive, RHO 1, ASR 1)</p> <p>“We couldn’t have [all] members in every single group so it was kind of the acceptable 8 or 10 people from that who were representative...Some [RHOs] did [participate], some didn’t. I mean we have obviously [remote RHOs] and they can’t afford to fly people down, you know, every month to meetings and things so they couldn’t really take part to the same extend”. (National Project Team Representative 2, ASR 2).</p>	

The key demand shaping the project, from adoption and through to implementation and early assimilation, was **coercive** pressure from the government to reduce costs in the public sector, particularly in healthcare (Table 3, Quote AP 1). Our respondents attributed these cost cutting demands to the post global financial crisis (2007-2008) public sector culture. These government demands for widespread cost cutting significantly altered all the components of the organising vision, including the business problematic that organisational actors associated with the new HRIS during the previous stage, the core technology, and the organisational practices surrounding the development of the system. The NHO had to diminish the original system specification dramatically, midway through procurement, due to budget cuts (Table 3, Quote AOV 1). Thus the organising vision for the innovation had to be narrowed down significantly in comparison with the expectations formed during the previous stage. Essentially the technology package became limited to core functionalities, with all the “nice to have” HRIS functionalities being eliminated. The cost cutting pressures also forced the NHO into the highly unusual position of having to state the budget available for the new HRIS in the tender announcement and to shift

from open to restricted procurement, which involved introducing pre-qualification questionnaire that supposed to save time both for the NHO and the applying bidders (Table 3, Quote AOV 2). Another coercive pressure was the national regulations on equality and diversity which required organisations to guarantee that all staff and candidates have equal opportunities and eliminate any possibility for discrimination during recruitment (Table 3, Quote AP 2). This coercive pressure introduced further changes in the HRIS' emerging business problematic. Thus, for example, one of the key requirements for the new system arising from equal opportunities regulations was that during recruitment, candidates' sex and age data should be invisible to the recruiting manager. This application of the system required, contrary with the expectations formed during the previous stage, that the system is customisable to accommodate differences in regulations (Table 3, Quote AOV 3). Critically, this expectation for system customisations to reflect regulatory demands introduced additional demands on the core technology to expand beyond the tight specifications within the tight budget as demanded by the coercive pressures for cost cutting (Table 3, Quote AOV 4).

This innovation stage was also influenced by managerial and technical **normative** pressures. While at the previous stage, *managerial normative pressure* assumed a simplistic approach to improve the efficiency of personnel management through standardising processes and practices across the NHOs, at this stage the normative demands for improving efficiencies were intertwined with the reality that the diversity in practices and structures in HR operations across individual RHOs are entrenched and any improvements have to accommodate to some extent this diversity (Table 3, Quote AP 3). This change in the emphasis of the managerial normative demands from expectations for an application of the system that assumes standardisation in processes in the previous stage, to one that accommodates different practices introduces further changes in the expectations concerning the ability to customise the system during its application, and creates additional demands for system specifications (Table 3, Quote AOV 5). The increase in system specification to accommodate the requirements of individual RHOs contrasted with the demands for tight specifications that shaped the procurement of the system to ensure fit within a tight budget.

The *technical normative pressure* manifested in (often taken for granted) extensive consultative processes that characterize work procedures within health sector, partially reflecting the wide diversity of specialisations and the need to involve and consult the variety of specialists within broad decision making process (Table 3, Quote AP 4). This technical normative demands for engagement and consultation across the spectrum of audiences involved with the system significantly shaped the organisational practices around the adoption of the system particularly

in what concerns system specification creation. For example, during the initial system specification creation, a complex organisational arrangement of workgroups were set up to facilitate the consultation and involvement of a wide range of diverse professionals across most RHOs. The aim of these organisational arrangements to support consultation was not only to elicit requirements, but also to ensure the “buy in” of these professionals into the system and facilitate its assimilation at the later stage (Table 3, Quote AOV 6).

Finally, the **mimetic** pressures present during the previous stage were also strongly manifested during the adoption stage of the HRIS innovation process. First, the demand to follow the example of the neighbouring country NHO might explain why, although NHO thoroughly considered various business case scenarios, the decision was made to procure the same off-the-shelf HR package that was acquired by the other country’s NHO (Table 3, Quote AP 5). This mimetic demand to copy the neighbouring NHO shape the expectations surrounding the organisational application of the innovation that was largely developed through comparison with the approach taken by this other similar but vastly large neighbour. For example, the other NHO system was Payroll led and this specification as a starting point for the HRIS system in the studied NHO. In contrast, the decision was taken to localize the application of the system to meet the needs of NHO to have HR led system (Table 3, Quote AP 6) that would be interfaced with the pre-existent national Payroll system, which was a solid and stable IS and thus in no need of replacement (Table 3, Quote AOV 7).

Similarly, the experience of using the same technical service provider within a range of national clinical IS implementations, including workforce systems, within the NHO could be a potential factor explaining the adoption of the system from the same provider (Table 3, Quote AP 7). The demands to follow similar projects with the same provider shaped the expectations of the NHO in terms of the organisational practices surrounding the adoption of the system. As the vendor worked with the NHO before on a number of similarly large and complex project, the expectation was that they are familiar with the complexity and demands of IS adoption in the NHO and thus the adoption process would be relatively smooth (Table 3, Quote AOV 8).

In conclusion, at this stage, the continuation of existing mimetic pressures and change in the emphasis of normative institutional pressures from the previous stage, as well as the emergence of new coercive demands alter the emerging organizational vision of the organizational actors concerning the HRIS around the *business problematic* and begin to shape specific expectations around the *core technology* and *organizational practices* involved in the adoption of the innovation. The scope of business application narrowed down, with the core technology being restricted on one hand to key functionalities to achieve within a tight budget, while on the other

hand had to include additional specific functionalities. In terms of organizational practices, on one hand the procurement process was dramatically simplified to reflect the need for completion within specified budget and narrow specifications, while on the other hand the development of system specifications was delayed due to the engagement in extensive and wide consultative practices.

While at the previous stage the expectations of organisational actors were broadly cohesive, at this stage conflicts begin to emerge between different expectations of organisational actors introducing conflicting expectations within the organizing visions. Such conflicts include the tension between the coercive pressures for cost cutting and tight specifications on one hand, and regulatory demands and changes in the emphasis of the managerial normative demands to allow for customisation on the other. These inherent tensions become embedded in the emerging organising vision of the HRIS explaining the change in strategic response of actors from acquiescence to compromise. The HR directors of individual RHOs who had originally supported and engaged with the system were now having to balance competing demands from different audiences: government for cost cutting and limited funding within tight specifications, NHOs pressures for engagement in wide consultative processes around the system to clarify these specifications, internal normative demands for efficient management through customising the system so that the agreed specifications reflect their internal requirements. The *compromise* strategy reflected the efforts of RHOs to reconcile these different expectations surrounding the organisational application of the innovation as well as the organisational practices involved in adopting the innovation (Table 3, Quote ASR 1).

Similarly with the RHOs, the national project team also engaged in compromise to deal with the inherent conflicting expectations embedded in the vision for the system. Thus, for example, they responded only partially to the technical normative demand for extensive consultative processes, as they did not involve representatives of all RHOs, nor from all potential future system user groups into the work on the core system specification. Instead, the focus was on seeking agreement within strong resource constraints where a *compromise* between fair rather than full participation was sought (Table 3, Quote ASR 2).

### **Innovation Stage 3: Implementation**

Different institutional pressures affected system implementation including data migration, system configuration and testing and shaping both the core technology and organisational practices of the emerging organising vision. Some of these pressures emerged at the previous HRIS innovation stages, but their influence on organisation vision changed during this stage (Table 4).

Table 4. Stage 3 **Implementation**. Data structure and exemplary quotes

Institutional Pressures	Organizing Vision
<b>Coercive =&gt; Organizational practices &amp; Core technology</b>	
Pressure on public sector and NHO to reduce spending [ <b>coercive</b> ]: “We had nowhere near [needed amount]. I mean miles away from it. We’re at the other end of the scale from that.” (National Project Team Respondent 2, IP 1)	Small central team will be able to manage all central implementation activities [ <b>organizational practices</b> ]: “So that immediately, when people said ‘right, well how can we get this system when we’ve only got that amount of money? What are we going to cut off?’ and it was things like the national project team cut it right down to the bare bones.” (National Project Team Respondent 2, IOV 1)  RHOs would be fully responsible for all local implementation activities and dedicate resources needed to manage them [ <b>organizational practices</b> ]: “They also said ‘well, rather than the national team be responsible for the implementation locally in the [RHOs] in the same way, the [RHOs] will take that responsibility’ and the [RHOs] signed up and they said ‘yeah, we’ll take that, we’ll do that, we’ll set up the teams locally’ and so on and so forth.” (National Project Team Respondent 2, IOV 2)
Data protection law [ <b>coercive</b> ]: “[Team of Developers] don’t have access to any employee data.” (Key Project Participant, Vendor, IP 2)	System testing with the dummy data will be sufficient [ <b>core technology</b> ]: “You test it all, raise any difficulties you’ve got with your data in their -, not real data clearly but dummy data, to work through and you check it all out. Once you’re happy with it all, you sign it off and the system’s good to go.” (National Project Team Respondent 1, IOV 3)
<b>Managerial normative =&gt; Organizational Practices</b>	
Variety of HR management practices adopted to reflect the diversity within RHOs [ <b>managerial normative</b> ]: “Some [RHOs] have got live data in but some of the data, sets are very small so for our data, you know, our data’s the equivalent of three or four other RHOs all at one time, so it’s got to be spot on for us.” (Senior HR Executive, RHO 2, IP 3)	Changing expectations about the transition involved in data migration [ <b>organizational practices</b> ]: “I would say [it] took probably longer than we would have envisaged.” (National Project Team Respondent 3, IOV 4).
Many organizational changes within NHO [ <b>managerial normative</b> ]: “As organizations have changed over the years therefore the changed departments, the changed titles, so folks have got lots of information against them that may be different now so, you know, you might have called it Department A before. It’s now Department D with lots of sub groups and that and that’s information that’s against an employee so it’s the complexity and some of that information is oh you have to decide are you going to keep it like that or are you going to modify it so that it’s the new information, the old information’s now not required? But you generally can’t -, it’s not that you can delete or anything like that, you kind of have to amend it to the new.” (eHealth Respondent, IP 4)	
<b>Technical normative =&gt; Business problematic &amp; Organizational practices</b>	

<p>Focus in health organizations is on clinical eHealth projects [<b>technical normative</b>]:</p> <p><i>“More investment, understandably, is placed on the clinical systems...and I think, bearing in mind that [the new HRIS] isn't progressing very quickly across [NHO], perhaps it hadn't been prioritized against clinical systems that are needed now.”</i> (Senior HR Executive, RHO 4, IP 5)</p>	<p>The vision was tried to be created that the new system is generic management system [<b>business problematic</b>]:</p> <p><i>“We keep promoting the fact that [new system] is not an HR system; that it's actually a management system”</i> (Senior HR Executive, RHO 4, IOV 5)</p> <p>Nominated professionals mostly with HR experience became responsible for the local implementation activities related to this project, in addition to their full time jobs [<b>organizational practices</b>]:</p> <p><i>“Yes of course, yeah, all of them [had daily jobs]. All of them, it was just a small part of their workload... In the beginning, we did not know how much work this would entail, so I think HR didn't grasp it very well.”</i> (Manager user, RHO 7, IOV 6)</p>
<p><b>Mimetic =&gt; Organizational practices and Core technology</b></p>	
<p>Challenging HRIS implementation among early adopters [<b>mimetic</b>]:</p> <p><i>“I went out to see a few people and said 'look, why aren't you using it, what is wrong with the system, what's the problem' and what came back was 'we don't really have a lot of confidence because nobody's using it'.”</i> (National Project Team Respondent 1, IP 6).</p>	<p>RHOs started forming a negative image for the new HRIS [<b>organizational practices</b>]:</p> <p><i>“And when the people at the bottom are saying, 'Oh, it doesn't work', that goes up the chain; they then come to meetings and go, 'Well, I've been told it doesn't work.' And you're going, 'But why?' and they're going, 'Well, I've been told it doesn't work.' But the damage is done, because they sit in a meeting saying, 'It doesn't do this.' And even if you say, 'Er, stop a minute. It does actually do that', all the people round the table have heard is 'it doesn't do that'.”</i> (National Project Respondent 2, IOV 7)</p> <p>Most RHOs with pre-existent HRIS decided to continue using their pre-existent systems until all functionality and technical issues with the new HRIS will be resolved [<b>core technology</b>]:</p> <p><i>“And then we'll be able to test that we can keep the system up to date, and then the plan would be, that would allow us, assuming that the system is deemed to be completely fit for purpose, to start to roll it out to managers. And then, stop our [pre-existent HRIS] contract at a point in time where we've got the system rolled out.”</i> (Senior HR Executive, RHO 8, IOV 8)</p>
<p><b>Strategic Responses</b></p>	
<p><b>Acquiescence</b> : <i>“Originally we were in phase three but then we moved to phase two... We felt we were ready because things appeared to be going well... So we were happy to do it at the time.”</i> (HR Professionals, RHO 5, ISR 1)</p> <p><b>Avoidance</b>: <i>“There are three [RHOs] as I said who haven't yet migrated now they've – because payroll, they're basically sticking with the payroll interface and because the payroll interface isn't going to be delivered till October they've now delayed until kind of May/June next year.”</i> (National Project Team Respondent 2, ISR 2)</p> <p><b>Defiance</b>: <i>“It was going to be four [RHOs] but [one RHO] dropped out because they felt that their own system, they had their own system at the time, gave them what they needed. They felt the risk of moving to the new system, given the difficulties and the extra time they'd taken, wasn't going to immediately take over from that system, there were going to be some gaps between them. So they asked to move to a later phase so we kind of rolled out with three [RHOs].”</i> (National Project Team Respondent 2, ISR 3)</p> <p><b>Compromise</b>: <i>“Now most of the [RHOs] have migrated the data. None of them are rolling out fully... but there are some pockets... departments within small areas, pilot groups really often.”</i> (National Project Team Respondent 2, ISR 4)</p> <p><b>Manipulation</b>: <i>“And back last summer, there was a view that it just felt we were treading water with this whole process. We weren't getting to the stage where it was getting rolled out across the [NHO] and used effectively. And we were saying, 'yeah, well, we're having similar problems.' There were just so many bits and pieces that needed to be looked at, and somebody needed to focus on working through these things. So what [central project team] agreed last summer was that it would be useful if we could get three [RHOs] who would look at the system and try and get it working end-to-end within their [RHOs].”</i> (Senior HR Executive, RHO 8, ISR 5)</p>	

The **coercive** pressure for reducing NHO's spending continued from the previous stages, but its influence at this stage was primarily on the organisational practices surrounding IS implementation (Table 4, Quote IP 1). Cost cutting pressures created the expectation that the entire implementation process will be coordinated centrally by a relatively small team, "cut to the bare bones", with the actual implementation being delegated to the local RHOs (Table 4, Quote IOV 1). These local RHOs based implementation teams were expected to be fully responsible for and able to dedicate resources to all local implementation activities (Table 4, Quote IOV 2). In accordance with the **technical normative** demands for work practices and specialisation, the local implementation teams have nominated professionals – with this being labelled an HR system (although it supposed to be used by every employee in NHO) were HR professionals, responsible for managing the local HRIS project. Due to cost cutting pressures, no additional staff was brought in in most of the RHOs, so the expectation was that the system would be implemented locally by the teams coordinated by these nominated HR professionals who were expected to manage the project in addition to their full time jobs (Table 4, Quote IOV 2).

A further coercive pressure that continued to shape the innovation during the implementation stage was the regulatory demand for data protection (Table 4, Quote IP 2). At this point, data protection demands shaped the expectations around the core technology of the innovation by preventing system developers' from accessing NHO employee's data, thus forcing the national project team and the vendor to seek alternative technical solutions to respond to this demand. The approach involved testing the system with dummy data rather than real data to ensure the system complies with the regulatory demands (Table 4, Quote IOV 3).

**Normative** pressures present at previous stages continued during implementation. *Managerial normative* pressures related to the diversity of HR structure, processes and practices across individual RHOs continued to influence the innovation during data migration at the implementation stage (Table 4, Quote IP 3). The demands to account for diversity in RHOs practices played a critical role in changing the expectations of organizational actors concerning the ease with which the envisaged core application of the IS innovation can be achieved. Diversity in HR practices meant diversity in the employee data that individual RHO collect and store, and which had to be migrated to the new system. This diversity led to the realization that the expected quick transition to the new system is unrealistic, and instead began being perceived as a long, difficult and protracted process (Table 4, Quote IOV 4). Associated with managerial normative expectations is also a tradition of continuous organizational changes to seek efficiency improvements through streamlining existent organizational processes across the RHOs, has also shaped the implementation of HRIS project (Table 4, Quote IP 4). Continuous organizational



changes led to amendments in some of the employee information (e.g. changes to job titles) during system implementation introducing added complexity by creating decision points about what information is important to transfer and what is not. These decisions concerning the relevance of RHOs data to be recorded is an example of the complexity of organizational practices characterizing the implementation of the innovation.

***Normative technical*** pressure for prioritising effort in clinical IS innovations that are perceived as supporting directly the ability to deliver high quality care to patients emerged during the implementation stage to further hamper the implementation process (Table 4, Quote IP 5). These technical norms influenced the expectations that actors have about the importance of the business problematic, and consequently about prioritization for funding. Many of our respondents reported that the focus on clinical IS innovations is at least partially responsible for the limited resources available for the delivery of the HRIS project within individual RHOs, thus further slowing down system implementation (Table 4, Quote IOV 5).

The project implementation was also challenged by the **mimetic** pressure, as later RHOs adopters were following early HRIS RHO adopters. The early adopters were confronted with significant system's technical and functionality issues, mostly having to do with the conflict between the tight specification envisaged due to cost pressures and the need for extensive customisation to deal with specific practices as well as broader regulations (Table 4, Quote IP 6). Technical problems also hampered the early implementation as the system within the procured tight specification was clearly not providing the range of functionalities that were envisaged originally. Consequently, informed by the early adopters of the system, later RHOs adopters begun to either postpone their local implementation activities or in extreme cases even withdraw from them. This mimetic behaviour quickly spread across other RHOs, thus placing at risk the complete delivery of this national project and realizations of its benefits. This mimetic pressures propagated a negative set of expectations around the organising vision both in terms of the usefulness of its organisational application and the functionality of the core technology (Table 4, Quote IOV 7). As expectations deteriorated, most RHOs with pre-existent HRIS decided to continue to use their existing systems until the functionality and technical issues of the innovation is resolved (Table 4, Quote IOV 8).

In conclusion, the institutional tensions that emerged during the adoption stage were amplified at the implementation stage leading to significant shifts in the expectations of the organisational actors surrounding organisational practices, core technology and the business problematic of the new HRIS. Organising practices were associated with the expectations for a nimble and relatively technically straightforward implementation: central coordination by a small central team, with

implementation activities delegated to local teams head by HR professionals and often with no additional resources dedicated. In contrast, the reality of the context of application introduced huge complexity in the innovation both in terms of application and core technology, for example in terms of technical difficulties, the need to accommodate varied processes and structures and changes in data. Thus during the implementation stage, conflicts within the organizing vision elements accentuated: while organisational practices reflected the original expectations for an off-the-shelf product, the organisational application was moving towards a customised system to respond to differences in practices and demands, and the core technology struggled to fulfil all business expectations within the tight budget imposed by cost cutting pressures.

To deal with the increasing tensions within the expectations embedded in the vision, RHOs engage in a range of different responses. In the early stages of the implementation when the tensions were not yet strongly apparent, several RHOs (especially small RHOs without pre-existent HRIS) decided to speed up their *acquiescence* to institutional pressures to adopt the new HRIS, and asked to move faster with implementation (Table 4, Quote ISR 1). As tensions within the organisation vision became apparent, the variety in RHOs' responses increased. Some RHOs displayed *avoidance* strategies by choosing not to engage into the implementation activities as per the planned schedule, instead deciding to wait until the system would be implemented by other RHOs to demonstrate that it was functional and fit for the purpose (Table 4, Quote ISR 2). Other RHOs adopted *defiance* strategy and actively withdrew from their unfinished implementation activities, in some cases after making massive investments in data migration to the new system (Table 4, Quote ISR 3). These defiant RHOs argued that the HRIS is not fit for purpose and asked the national implementation team to demonstrate that the new system is fully functioning and fit for the purpose as a condition to re-engage with the implementation process. Those RHOs who proceeded with their implementation activities adopted *compromise* strategy seeking to negotiate and pacify both their external (NHOs) and internal (HR, IT) audiences (Table 4, Quote ISR 4). These compromising RHOs either (i) asked for many configurations/customizations so that the system would be able to accommodate most of their pre-existent HR practices; (ii) adopted the new system either only within their HR departments, small pilot groups outside of HR and/or made the utilization outside of HR voluntary; and/or (iii) implemented only some module/s of the new system that they were happy with, while continuing to use their previous approach for other models (e.g. rely on a particular module of their existing system, leading to widespread replication of work in these RHOs, in particular double data entry, while also paying for two systems for those RHOs with pre-existent HRIS).

As the organising vision was marred by mounting tensions, negative expectations building up and the project being stalled, and with coercive pressure for adoption increasing, *defiance* and *avoidance* were difficult to maintain and *compromise* did not manage to achieve much success in pacifying divergent demands. In an effort to resolve the conflict and generate some consensus around a new vision of what the innovation should and could be, a number of RHOs adopted *manipulating* strategy in attempting to change the original intuitional expectations around the system (Table 4, Quote ISR 5). They requested the central implementation team to conduct a pilot to produce evidence that would identify which part of the system is fit for purpose and which is not, and to generate a list of best practices on system implementation and usage. In an attempt to solve the conflict and move forward the vision around the innovation, this request was accommodated by the central team which launched a pilot to test the system in three RHOs willing to engage with the pilot. The pilot was assessed by an external consultancy organisation (impartial to the demands and expectations that characterised the project and thus trusted by both RHOs and NHO) which produced the evaluation report.

## Discussions & Conclusion

We set out to contribute to institutional IS literature by exploring the processes through which institutional pressures shape the intention to adopt, adoption and implementation of an IS innovation within an organizations setting (Orlikowski and Barley, 2001) particularly by examining such influences over time. We also draw on the concepts of the *organizing vision* and *strategic responses*, in order to understand how organizational actors interpret the nature and goals of the innovation and react to the various institutional pressures associated with them.

Unlike other IS studies that have examined the influence of institutional pressures on IS innovation at one point in time (see Mignerat and Rivard, 2009 discussion), our study shows how actors' expectations about the innovation adapt in response to changing institutional demands over time, and how these shifts influence their response strategies.

Our results indicate that *at the comprehension stage*, alignments between all three types of institutional pressures, although some contradictions (e.g. lack of system customization) were not acknowledged by the organizational community, led to cohesive expectations concerning the core business problematic of the innovation and resulted in an initial *acquiescence* response, whereby organizational actors rallied behind the emerging organizing vision and supported the innovation. This alignment was demonstrated in a shared expectation across the NHO that the new IS would be universally implemented and would produce efficiencies that would benefit all actors.

As the innovation progressed through adoption and implementation, misalignments between coercive, normative and mimetic pressures begin to manifest more strongly, exposing the inherent conflicting expectations that became part of the organizing vision about the technology itself, the organizational practices that would be changed and how these would be addressed by the innovation. Our analysis suggests that it is these inconsistencies within the different components of the organizing vision, rather than, as suggested by previous research (see Bunduchi et al., 2015) the multiplicity of mental models that different groups of actors help about the innovation that led to multiple strategic responses. We also found that as changes in institutional demands increase the tensions within the organizing vision (e.g. that created extensive specification can be reduced to accommodate cost cuts versus the created expectation that system needs to be customizable to accommodate variety in RHOs practices), the variety in response strategies increases reflecting greater uncertainty. Thus whilst previous research indicates a linear move from acquiescence to manipulation as environmental uncertainty increases (e.g. Oliver, 1991), our findings suggest an increase in the variety of responses during the implementation stage ranging from compromise to manipulation.

Through its empirical focus on HRIS in health, this institutional study also helped to deepen our understanding of the processes involved in the comprehension, adoption and implementation of IS innovations in the health sector, which are shaped as much by regulative, cultural and structural forces, as by technical and economic ones, as well as by misalignments within them. Our institutional lens allowed us to explain the unexpected difficulties that NHO encountered during the implementation of an IS innovation that seems to have been strongly supported at the outset. Delays and difficulties during the progression of the innovation emerged as a consequence of conflicting expectations about the role and application of the IS within the organisation. However, despite these delays and difficulties encountered, the project has also offered tremendous opportunities for the NHO to reconsider and reconfigure its existing HR processes, which have been highly variable and, in many cases, suboptimal. The experience of engaging in the consultations surrounding the project, considering the work-arounds required by the new system and negotiating common requirements, has allowed individual RHOs to begin to consider changes in their current working practices, as well as to agree the type of system that would enable alignment between them through a set of standard working practices. Therefore, benefits from this project are likely to arise not only from the implementation of the HRIS system but also from the redesign of standard operating processes which has accompanied the implementation, and which has required a significant investment of time and effort from project stakeholders across all studied NHO.

Finally, our research has significant implications for policy and practice. Increasingly sophisticated, modular HRIS are being procured and implemented in health organizations worldwide (Sierra Cedar, 2015), often at high expense in terms of technology, support and change management. While the benefits of these systems have been much vaunted by HRIS vendors and policy makers, recent years have also seen spectacular failures, where large scale implementation programs have encountered huge overspends, weak organizational buy-in or poor interoperability with existing systems (Thite & Sandhu, 2014). Given the opportunity costs of getting these projects wrong, developers, procurers, and managers require more guidance on the usefulness, effectiveness and implementation barriers associated with HRIS, as well as how to evaluate them. Our research findings offer several suggestions on how to smoothen this often complex HRIS comprehension, adoption and implementation. Thus the HRIS innovation process should be informed by understanding of various institutional demands, which can be sometimes conflicting, and their role in shaping the stakeholders' expectations about the applications of the innovation, and their strategic responses to these pressures.

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